

# GW7125

## Smart Ultrasonic Sensor SoC

### Description

The GW7125 is a device that combines an integrated microcontroller and an analog front end to provide ultrasonic range detection using a minimal number of components. Its pulse-width modulation (PWM) output allows for programmable bursts to be sent to a single ultrasonic transducer. With the support of compatible transducers, this device allows for distance measurement ranging from 10cm to 6m using an external Transformer, from 10cm to 4.5m using a Tri-State-buffer and can be utilized for presence detection within the range of 0cm to 10cm.

By utilizing internal components such as a programmable gain amplifier (PGA), a 12-bit analog-to-digital converter (ADC), digital filters, an envelope detector, and a peak detector, the desired measurement range and resolution can be achieved. Additionally, the device includes an internal temperature sensor and ADC for reading operating temperature information.

The device includes a 16KB embedded Flash memory for storing application-specific program and data, while a 2KB SRAM is available for storing data required for signal processing purposes.

The GW7125 offers various communication interfaces, including UART, I2C and I/O communication making it convenient to connect with a host device.

### Features

- Analog Front End integrated stand-alone Ultrasonic Sensor Solution
- PWM output driver for Ultrasonic Transducer
- Programmable Transducer Power
- Programmable Receiver Sensitivity
- Digital Filtering and Signal Processing including Envelope Detection
- Adjustable Burst Length and Filter Bandwidth
- Internal Oscillator
- 8bit CPU with 16MHz Clock
- 16KB Flash memory for application program
- 2KB SRAM
- Fast Calibration Data and Program Update via Communication interface

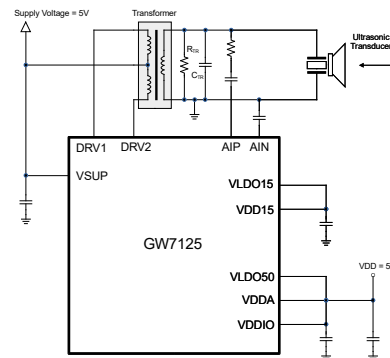
### Physical Characteristics

- Operating voltages
  - External supply voltage: 5V
  - I/O supply voltage: 5V
  - Analog core voltage: 5.0V
  - Digital core voltage: 1.5V
- Operating temperature: -40°C ~ 105°C (AEC-Q100 Grade 2)
- Available in 5x5 0.4mm pitch 40-QFN package

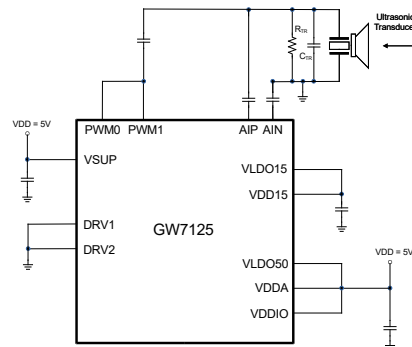
### Typical Applications

- Ultrasonic Sensor Systems
- Blind Spot Detection
- Industrial Distance Measuring
- Robotics

### Basic Application Diagram

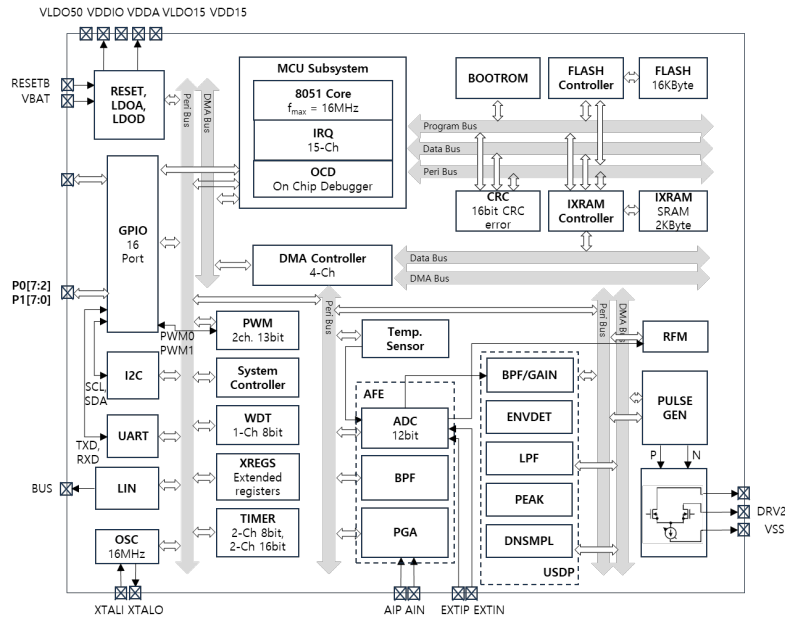


Long-Distance Measurement:  
Need a transformer to drive the ultrasonic transducer



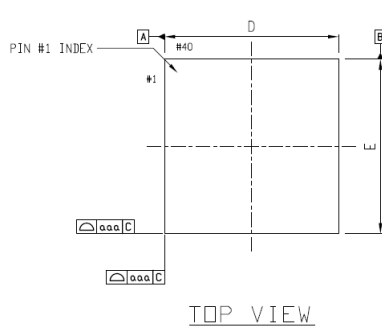
Direct Drive Mode  
For Distance measurement and Presence detection

## Block Diagram

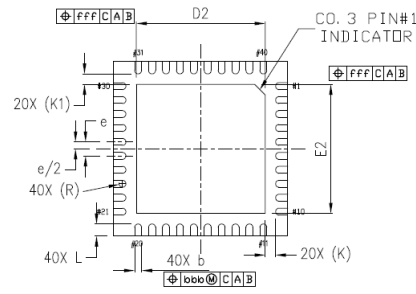


\*\* LIN interface input/output, GW7120 exclusive

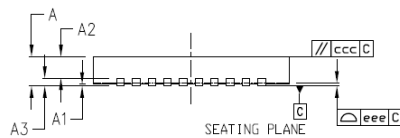
## Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

	SYMBOL	MIN	NDM	MAX
TOTAL THICKNESS	A	0.70	0.75	0.80
STAND OFF	A1	0	0.02	0.05
MOLD THICKNESS	A2	---	0.55	---
L/F THICKNESS	A3	0.203	REF	
LEAD WIDTH	b	0.15	0.20	0.25
BODY SIZE	X	4.90	5.00	5.10
	Y	4.90	5.00	5.10
LEAD PITCH	e	0.40	BSC	
EXPOSED PAD SIZE	X	DE	3.60	3.70
	Y	EE	3.60	3.70
LEAD LENGTH	L	0.30	0.35	0.40
LEAD TJP TO EXPOSED PAD EDGE	K	0.30	REF	
LEAD TJP ROUND SIZE	K1	0.30	REF	
LEAD TJP ROUND SIZE	R	b MIN/2	---	---
PACKAGE EDGE TOLERANCE	aaa	0.10		
MOLD FLATNESS	ccc	0.10		
COPLANARITY	eee	0.08		
LEAD OFFSET	kkb	0.07		
EXPOSED PAD OFFSET	fff	0.10		

## Ordering Information

Device name	Package	Remark
GW7125IRSBT	5.0mm x 5.0mm, 0.4 mm pitch	40QFN, Industrial

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